Before the
Federal Communications Commission
Washington, D.C.

In the Matter of	)	
	)	
Revision of the Commission's Rules	)	CC Docket No. 94-102
To Ensure Compatibility with	)	RM-8143
Enhanced 911 Emergency Calling Systems	)	
	)	

Comments of Ericsson Inc. In Response to the Further Notice of Proposed Rulemaking

Ericsson Inc. ("Ericsson") by its attorney, hereby submits its comments in response to the *Further Notice of Proposed Rulemaking*[1] in the above-captioned proceeding. In support of its comments, Ericsson states as follows:

I. Introduction

In the FNPRM the Commission seeks comment on issues which look beyond the rules adopted in the *Report and Order* in this proceeding. Specifically, the Commission seeks comment on whether rules should be adopted to require covered wireless carriers to deliver more precise location information to PSAPs. The Commission proposes to require wireless 911 calls to be located within a radius of 40 feet in a three dimensional environment 90% of the time. The Commission also seeks comment on whether rules should be adopted to require covered carriers to transmit all wireless 911 calls to the appropriate PSAP regardless of the technology used by the subscriber's "home" system. Though Ericsson supports the Commission's goal to make 911 service available to

[1] *In the Matter of Revision of the Commission's Rules To Ensure Compatibility with Enhanced 911 Emergency Calling Systems,* Report and Order and Further Notice of Proposed Rulemaking, FCC 96-264, __ Rcd ___ (released July 26, 1996) (hereinafter "FNPRM").

wireless subscribers to the greatest extent possible, it does not believe that either of these proposals are currently technically feasible or serve the public interest. Rather than saddle wireless carriers competing in a new regulatory environment with burdensome rules, Ericsson urges the FCC to refrain from adopting regulations described above.

II. Location Information Technology

The Commission requests comment on whether to adopt rules which would require covered wireless carriers to be able to locate 911 callers within a radius of 40 feet in a three dimensional environment 90% of the time. Its proposal is based on the fact that the 40 foot concept was expressed as a goal in the October 1994 Joint Experts Meeting ("JEM") report[2] and its own estimate that such a standard would be feasible at the end of the 5 year Phase II period established in the *Report and Order* in this proceeding.[3] Simply stated, the Commission's estimate is neither supported by record evidence nor likely to be achievable in a 5 year timeframe.

Though wireless technology will continue to evolve in the future as it has done in the past, there is no guaranty that location information technology will advance over the next 5 years to the extent required to meet the proposed 40 foot rule. In this regard, it must be noted that the JEM did not conclude that the wireless industry could meet a 40 foot location requirement. Rather, the JEM only established the 40 foot rule as a goal to which the industry should strive.

At the present time there are two primary technologies which can arguably be used

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[2] FNPRM, para. 138.
[3] Id. Para. 139.

by the wireless industry to locate wireless subscribers on a basis other than by cell site or sector--GPS and triangulation by terrestrial radio. Though both are theoretically capable of providing location within a 40 foot radius in an ideal environment, neither is capable of providing 40 foot accuracy in a three dimensional environment 90% of the time. This is due to the fact that the radio environment in which real-time, two-way interconnected voice CMRS providers operate is not an ideal environment for purposes of radiolocation.

GPS technology depends on the GPS receiver having line of sight with a constellation of satellites. To be effective a GPS receiver's antenna must have an unobstructed view of 3 satellites to locate in a two dimensional environment (latitude and longitude) and 4 satellites to locate in a three dimensional environment (latitude, longitude and altitude). Today's wireless subscribers use portable terminals inside buildings, inside vehicles without external antennas, under awnings, trees and in a variety of other areas where a GPS signal would be blocked, thereby precluding any fix, let alone a fix that is accurate to within 40 feet in a three dimensional environment 90% of the time.

Technologies based on triangulation of terrestrial-based radio systems are subject to similar vagaries. In order to obtain a position fix of any significant accuracy, it is necessary for a receiver to obtain signals from three separated base stations. In today's radio environment one can not be certain a wireless subscriber terminal will receive signals from three base stations. This is especially true in rural areas where, due to less intensive capacity demands, overlapping RF coverage from multiple base stations may not be necessary. Even in urban environments, where there is likely to be significant theoretical overlap of signals from multiple radio base stations, not all signals from all base stations will penetrate a building or all portions of a building. Also, reflection of RF signals from

buildings may make them less than reliable for purposes of establishing a very accurate position fix.

Ericsson is unaware of any technology available today at reasonable cost and size for the wireless market that will render position fixes accurate to 40 feet in a three dimensional environment 90% of the time. In fact, virtually all parties that filed petitions for reconsideration of the *Report and Order* in this proceeding argued that the Phase II requirement to locate wireless 911 calls within a 125 meter radius in a two dimensional environment within 5 years of the effective date of the Commission's rules, was not technically feasible.[4] In view of the foregoing, Ericsson requests that the Commission refrain from adopting the 40 foot rule until such time as there is evidence that technology to implement the rule is available in the marketplace.

III. Access To 911 Service via Multiple Mobile Systems

The Commission asks for comment on whether it is possible to enable wireless 911 calls to be transmitted over any wireless system in the area in which the mobile unit is located to ensure that the call is transmitted to the appropriate PSAP. It also asks if there is a protocol that can be developed to overcome interoperability problems caused by the lack of federally-mandated standards for digital technologies. The Commission's request is premised on the concept that "...ideally, a 911 call should be handled by whatever wireless system is available in the area of need and, if there are multiple systems available, by the one that will provide the quickest and most reliable and accurate response."[5]

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[4] All major manufacturers that submitted comments in CC Dkt. No. 94-102 advised the Commission that meeting the Phase II (Phase III in the original NPRM) requirements in 5 years was questionable.
[5] FNPRM, para. 145.

Ericsson agrees that the ideal would be wonderful. However, the ideal can not be achieved at this point in time because the wireless industry is operating in a competitive, environment that is not conducive to achieving interoperability with regard to the full panoply of digital standards that exist in the marketplace.

Rather than adopt uniform technical standards for digital cellular, broadband PCS and other services as it did for analog cellular, the Commission chose to promote a regulatory scheme in which the marketplace would determine which services and technologies would succeed (or fail). The decision appears to have been a good one inasmuch as increased competition in the CMRS market has had demonstrable positive benefits for consumers in terms of making innovative new equipment and services available at very reasonable prices. Having embarked on a new course of regulation, however, the Commission must recognize that there can be a downside to the competitive marketplace. The downside in this particular situation is that interoperability between wireless systems using distinctly different technologies is extremely difficult to achieve and comes at the expense of more costly and complex portable handsets.

Assuming the issue of proprietary interfaces was not a problem, from a technical standpoint it is possible to manufacture a handset that is capable of operating over the wide range of frequencies (and the associated modulation techniques and bandwidths) allocated to CMRS providers who are subject to the wireless 911 rules. Nonetheless, such wireless devices would have to be extremely large to accommodate numerous radios operating pursuant to different standards. Such devices would also be extremely expensive since the cost of multi-mode radios in wireless handsets would be substantial. Thus, the issue is not whether the Commission's goal is technically possible, but rather

whether the public interest would be served by requiring wireless 911 calls to be transmitted to PSAPs using any system in which the mobile unit is located.

Given the current state of technology and the multiplicity of digital systems in the marketplace, Ericsson is of the view that the public interest would not be served by adoption of such a rule. Unlike certain rules for which compliance can be achieved through software changes which are transparent to underlying networks using different technologies (e.g., number portability and Phase I wireless 911 requirements), a rule requiring wireless 911 multiple access would necessitate hardware and software changes which are inconsistent with the state of the industry today and would be counterproductive to today's competitive wireless environment.[6] As noted above, the cost of devices capable of transmitting over all wireless systems would be orders of magnitude more than mobiles without such capability. Also as noted above, the size of the portable units would increase substantially. Portable units would no longer be lightweight, pocket-sized devices with ample battery time. Consumers might well find more expensive, bulkier devices less user friendly resulting in decreased demand for wireless services in general. In effect, promulgation of the E911 "multiple access" rule could have a chilling effect on the growth of the wireless industry and should therefore not be adopted.

IV. Conclusion

Ericsson does not oppose delivery of E911 services over wireless facilities. Such services clearly provide a valuable public benefit. Nonetheless, Ericsson can not support mandatory imposition of the rules proposed in the *FNPRM* because technology is not

[6]The problem would be exacerbated in the future as new technologies are developed.

currently available to meet the 40 foot rule (nor will it be in 5 years) and the benefits to be derived by imposition of the multiple access rule are outweighed by the negative impact the rule would have on the cost and size of portable terminals. Ericsson submits that a decision to refrain from adopting the proposed rules because technology is not presently capable of meeting the requirements, is consistent with other actions the Commission has recently taken. For example, in the *Second Report and Order* in CC Docket No. 94-54, the FCC adopted rules which require two-way, interconnected, real-time voice CMRS carriers to provide "manual roaming" only to the extent the roamer's handset is capable of accessing a "foreign" system. The FCC also specifically expressed the view that CMRS carriers need not modify their systems to offer manual roaming. Similarly, in the *Third Notice of Proposed Rulemaking* in the same proceeding, the Commission tentatively concluded that "automatic roaming" should not be required since direct interconnection of switches was not technically practical.

Based on the foregoing, Ericsson requests that the Commission refrain from adopting rules which would require wireless carriers to locate 911 calls within a 40 foot

radius 90 % of the time and which would require wireless carriers to transmit wireless 911 calls over any system in the area in which the mobile unit is located.

Respectfully submitted,

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